

# Pain Research: An Overview

May 2003

---

## About Pain

Throbbing, burning, aching, stinging – the terms patients use to describe pain are often different because pain is personal and subjective and influenced by age, gender, race/ethnicity, and psychosocial factors. The International Association for the Study of Pain defines it as an unpleasant experience associated with actual or potential tissue damage to a person's body.

There are two basic forms of physical pain: acute and chronic. Acute pain, for the most part, results from disease, inflammation, or injury to tissues. It is immediate and usually of a short duration. Acute pain is a normal response to injury and may be accompanied by anxiety or emotional distress. The cause of acute pain can usually be diagnosed and treated.

Chronic pain is continuous pain that persists for more than 3 months, and beyond the time of normal healing. It ranges from mild to severe and can last weeks, months, or years to a lifetime. The cause of chronic pain is not always evident, although it can be brought on by chronic conditions such as arthritis and fibromyalgia. Chronic pain can often interfere with a patient's quality of life, sleep, and productivity.

## A Symptom of Many Diseases

Pain often accompanies diseases of the bones, muscles, joints, and skin, which affect millions of Americans. Most of these diseases are chronic and may cause lifelong pain. In certain cases, such as with some rheumatic diseases, the sources of pain may include inflammation of the synovial membrane (tissue that lines the joints), the tendons, or the ligaments; muscle strain; and muscle

fatigue. A combination of these factors contributes to the intensity of the pain. Muscle inflammation characterizes other painful disorders such as polymyositis (characterized by inflamed and tender muscles throughout the body, particularly those of the shoulder and hip) and dermatomyositis (characterized by patchy red rashes around the knuckles, eyes, and other parts of the body, along with chronic inflammation of the muscles).

In other cases, such as with myofascial pain syndromes, the cause of the pain is unknown. Myofascial pain syndromes affect sensitive areas known as trigger points, located within the body's muscles. It is important to consult with a physician to help determine the cause and treatment for your pain.

## Talking to Your Doctor About Pain

Pain is managed by the patient and his or her health care providers. In order to help assess the cause and treatment for your pain, a doctor will usually do the following:

- Take your medical history
- Review any medications you are using
- Conduct a physical examination to determine the causes of pain and how this pain is affecting your ability to function
- Take blood and/or urine samples and request necessary laboratory work
- Ask you to have x rays taken or undergo other imaging procedures such as a CAT (computerized axial tomography) scan or MRI (magnetic resonance imaging)

There is no medical test that can convey the level of pain you are feeling. Only you can describe your pain. In order to provide an accurate description of your pain, it may be

helpful to share the answers to the following questions with your doctor:

- How long have you had pain?
- Where is the pain located?
- Does the pain come and go or is it continuous?
- What makes the pain better or worse?
- Has the pain changed since your last visit with your doctor?
- What medications or treatments have you tried for the pain?

After you have been evaluated by your doctor, he or she will discuss the findings with you and design a comprehensive management plan for your pain. There are currently many treatment options available for pain, and scientists believe that research can help lead to more and better treatments for pain in the future.

## **Research on Pain**

Pain research is conducted and funded by the Department of Health and Human Services' National Institutes of Health (NIH) by many of its institutes and centers, including the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). Although some of this research on pain is not linked to any disease specifically, certain aspects of pain research are applicable to many diseases.

The research on pain supported by NIAMS covers a broad spectrum from basic research to clinical studies to behavioral interventions. This research is needed to:

- determine the most effective drug and nondrug therapies and interventions, including complementary and alternative treatments
- remove barriers to effective treatment
- identify assessment tools for patients unable to describe their pain
- identify effective pain management strategies for individuals with disabilities and in underserved populations

NIAMS currently supports research on pain conducted by scientists in laboratories on the NIH campus, and through grants and contracts to researchers in universities, research institutions, and medical centers across the United States. This research includes basic and behavioral investigations, such as pain processing mechanisms in the brain and central nervous system; stress response systems and pain; gender and hormonal influences on pain; and coping methods for pain.

Grant and contract applications submitted to NIH go through a two-step peer review process. Applications from researchers are first reviewed by panels of outside experts for their scientific merit. Applications are then reviewed by the Institute's Advisory Council, which assesses the relevance and priority of proposed projects, and makes recommendations on funding particular meritorious applications. This process is used throughout NIH for applications in all diseases and areas of science.

## **Why is Basic Research Important to Understanding Pain?**

Basic research is work undertaken primarily to acquire new knowledge of the biological, behavioral, and social mechanisms that underlie health and disease. This type of research, which is often conducted using animal models, provides the broad base of knowledge necessary to advance the diagnosis, treatment, and prevention of many diseases. NIAMS supports a wide and diverse body of basic research, since it is hard to know where scientific advances will come from. Progress in one research area provides data for other areas. Similarly, progress in areas supported by other NIH institutes provides valuable information for diseases within the NIAMS mission. That is why it is essential to support basic studies across the research spectrum and to encourage sharing of knowledge from experts in many disciplines.

## **Why Is Behavioral Research Important to Understanding Pain?**

Pain has a profound effect on the quality of human life. Pain can cause disruptions in sleep, eating, mobility, and overall ability to function. Progress is being made in understanding the physiological mechanisms involved in pain. However, understanding individuals' pain experience presents unique scientific challenges. The levels of pain different people experience and their reactions to it vary widely, perhaps due to psychological state, age, gender, social environment, and cultural background, as well as genetic or physiological differences. Thus, the pain experience needs to be examined at all levels of basic and clinical research, including behavioral research, with the goal of developing interventions to manage or prevent pain.

Behavioral and social sciences research include a wide array of disciplines. The field uses such techniques as:

- surveys and questionnaires
- randomized clinical trials
- direct observation
- descriptive methods
- economic analyses
- laboratory and field experiments
- standardized tests
- evaluation

## **Highlights of Current and Planned Initiatives**

**NIH Pain Research Consortium.** The NIH Pain Research Consortium encourages information sharing and collaborative research efforts across NIH in the field of pain research. Directors of participating NIH Institutes meet to exchange information, propose topics for workshops and conferences, and support program announcements in the field of pain research. These meetings help to provide coordination of pain research across all NIH components,

and ensure that results of NIH-sponsored pain research are widely communicated.

**Sex and Gender Factors Affecting Women's Health – Specialized Centers of Research (SCORS).** In conjunction with the NIH Office of Research on Women's Health and other NIH institutes, NIAMS is co-funding research on the role of sex- and gender-related health effects. As part of this initiative, a multidisciplinary SCOR is devoted to studying the mechanisms of chronic pain, with special focus on sex-related factors that influence pain and painful clinical conditions that show a high prevalence in women. This center will help apply basic knowledge to the study of persistent pain in humans, and ultimately to developing new ways to diagnose and treat these conditions in the general population.

**The Management of Chronic Pain – Program Announcement.** NIAMS is co-sponsoring an announcement for grants to study management of chronic pain across the lifespan. It has been estimated that 4 out of every 10 people with moderate to severe pain do not get enough relief for chronic pain. The announcement's goal is to encourage research to find effective interventions, effective drug and nondrug treatments, assessment tools, and management strategies for pain.

## **Information Resources**

### **National Institute of Arthritis and Musculoskeletal and Skin Diseases**

National Institutes of Health  
1 AMS Circle  
Bethesda, MD 20892-3675  
Phone: 301-495-4484 or 877-22-NIAMS (226-4267) (free of charge)  
Fax: 301-718-6366  
[www.niams.nih.gov](http://www.niams.nih.gov)

The National Institute of Arthritis and Musculoskeletal and Skin Diseases provides information about rheumatic, bone, muscle, and skin diseases. It distributes patient and

professional education materials and refers people to other sources of information. Additional information and updates can also be found on the NIAMS Web site.

**National Institute of Dental and Craniofacial Research**

National Institutes of Health  
45 Center Drive, MSC 6400  
Building 45, Room 4AS-25  
Bethesda, MD 20892-6400  
Phone: 301-496-4261  
[www.nidcr.nih.gov](http://www.nidcr.nih.gov)

The National Institute of Dental and Craniofacial Research (NIDCR) provides information about craniofacial-oral-dental diseases and disorders. It distributes patient and professional education materials and refers people to other sources of information. Additional information and updates can also be found on the NIDCR Web site.

**National Institute of Neurological Disorders and Stroke**

National Institutes of Health  
Office of Communications and Public Liaison  
P.O. Box 5801  
Bethesda, MD 20824  
Phone: 301-496-5751 or 800-352-9424 (free of charge)  
Fax: 301-402-2186  
[www.ninds.nih.gov](http://www.ninds.nih.gov)

The National Institute of Neurological Disorders and Stroke (NINDS) provides information about neurological disorders. It distributes patient and professional education materials and refers people to other sources of information. Additional information and updates can also be found on the NINDS Web site.

**American Chronic Pain Association**

P.O. Box 850  
Rocklin, CA 95677  
Phone: 916-632-0922  
[www.theacpa.org](http://www.theacpa.org)

This association provides information on positive ways to deal with chronic pain and can provide guidelines on selecting a pain management center.

**American Pain Society**

4700 West Lake Avenue  
Glenview, IL 60025-1485  
Phone: 847-375-4715  
[www.ampainsoc.org](http://www.ampainsoc.org)

This society provides general information to the public and maintains a directory of resources, including referrals to pain centers.

**National Chronic Pain Outreach Association, Inc.**

7979 Old Georgetown Road, Suite 100  
Bethesda, MD 20814-2429  
Phone: 301-652-4948  
Fax: 301-907-0745  
[neurosurgery.mgh.harvard.edu/ncpainoa.htm](http://neurosurgery.mgh.harvard.edu/ncpainoa.htm)

This association operates an information clearinghouse offering publications and cassette tapes for people with pain. It also publishes a newsletter that includes information on pain management techniques, coping strategies, book reviews, and support groups.

**National Foundation for the Treatment of Pain**

P.O. Box 70045  
Houston, Texas 77270-0045  
Phone: 713-862-9332  
Fax: 713-862-9346  
[www.paincare.org](http://www.paincare.org)

This organization provides support for patients who are suffering from pain, their families and friends, and the physicians who treat them. They also offer a patient forum, advocacy programs, information, support resources, and direct medical intervention.

The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the Department of Health and Human Services' National Institutes of Health (NIH), is to support research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases. The NIAMS Information Clearinghouse is a public service sponsored by the Institute that provides health information and information sources. Additional information can be found on the NIAMS Web site at [www.niams.nih.gov](http://www.niams.nih.gov).

**National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)  
National Institutes of Health**

1 AMS Circle

Bethesda, MD 20892-3675

Phone: 301-495-4484 or 877-22-NIAMS (226-4267) (free of charge)

TTY: 301-565-2966

Fax: 301-718-6366

E-mail: [NIAMSInfo@mail.nih.gov](mailto:NIAMSInfo@mail.nih.gov)

[www.niams.nih.gov](http://www.niams.nih.gov)

NIAMS provides information about various forms of arthritis and rheumatic disease and bone, muscle, joint, and skin diseases. It distributes patient and professional education materials and refers people to other sources of information.

Additional information and updates can also be found on the NIAMS Web site.

*The National Institutes of Health (NIH) is a component of the U.S. Department of Health and Human Services (DHHS).*